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Saturated Fatty Acid Intake as a Risk Factor for Cardiovascular Disease in Healthy Caucasian Adults from Western Populations

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Author's contribution

This work was carried out in collaboration between both authors. Author PT designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author SM managed the analyses of the study. Both authors read and approved the final manuscript.

Conference Abstract

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ABSTRACT

Background: Cardiovascular disease (CVD) is the leading cause of premature death globally (WHO, 2010). For over 50 years saturated fatty acids (SFA) have been implicated as a main dietary risk factor for CVD. Therefore national guidelines recommend limiting SFA to <10% of total daily energy intake COMA, [1]. However, recent literature has begun to question this advice due to contra evidence showing SFA not to be a risk factor for CVD, Hoenselaar [2]. This study's aim was to investigate the relationship between SFA and CVD to assess whether or not recommendations should be made to review national guidelines.

Method: A systematic review and meta-analysis were conducted. Electronic research databases were searched using variations of the keywords "saturated fatty acids" and "cardiovascular disease". Articles were only included if they had a randomised control trial (RCT) or prospective cohort (PC) study design. Additionally participants had to meet the following criteria: Caucasian, non-smokers, normal BMI, classed as healthy, no pre-existing CVD related conditions, not taking cholesterol altering drugs and no inborn errors of lipid metabolism. Articles were also only included if they were conducted in western populations in an attempt to standardise environmental factors. In the PCs, only data which was adjusted for these factors was included. Articles were assessed for quality

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using the Jadad et al. [3] scoring/CASP tool and for confounding variables, risk of bias and homogeneity.

Results: A total of 411 articles were identified. Eight articles were included after exclusion for duplication, study design, not meeting full inclusion criteria, low quality, confounding variables, high risk of bias and heterogeneity. Of these, 4 were RCTs and 4 were PCs including 193,409 participants (192,686 female, 723 male). RCT and PC data were analysed separately. For the RCTs, LDL-cholesterol concentration post high/low SFA intervention was used as a functional biomarker for CVD risk. For the PCs the number of CVD related events in the low/high SFA diet groups was used as the marker for CVD risk. In the RCT meta-analysis there was a standard mean difference (95%CI) of -0.94 (-1.17, -0.71) ($p<0.00001$) favouring the low SFA diet to decrease the risk of CVD. In the PC meta-analysis a risk ratio (95%CI) of 1.00 (0.64, 1.58) ($p=1.00$) showed there to be no statistically significant relationship between SFA and CVD. Sensitivity analyses conducted predominantly showed no change in outcome.

Discussion: RCT outcomes favoured a low SFA diet for lowering CVD risk whereas the PC outcome showed no relationship. Although these differed they indicate that SFA does not increase CVD risk in western Caucasian adults. However further research is needed before requesting recommendations for the review of national guidelines. These findings correlate with other systematic reviews/meta-analyses e.g. Skeaff and Miller, [4].

Conclusion: From the studies included SFA does not increase CVD risk in affluent Caucasian adults.

Keywords: *Saturated fatty acids; cardiovascular disease; low Density Lipoprotein; cardiovascular related events; caucasian adults.*

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